Public Availability Session
Groundwater Contamination

Four Seasons Dry Cleaner
8947 West Central
Wichita, Kansas

April 10, 2014

Wilbur Middle School

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Kansas Dept. of Health & Environment

Kansas
Department of Health and Environment

Our Mission: To protect and improve the health and environment of all Kansans.

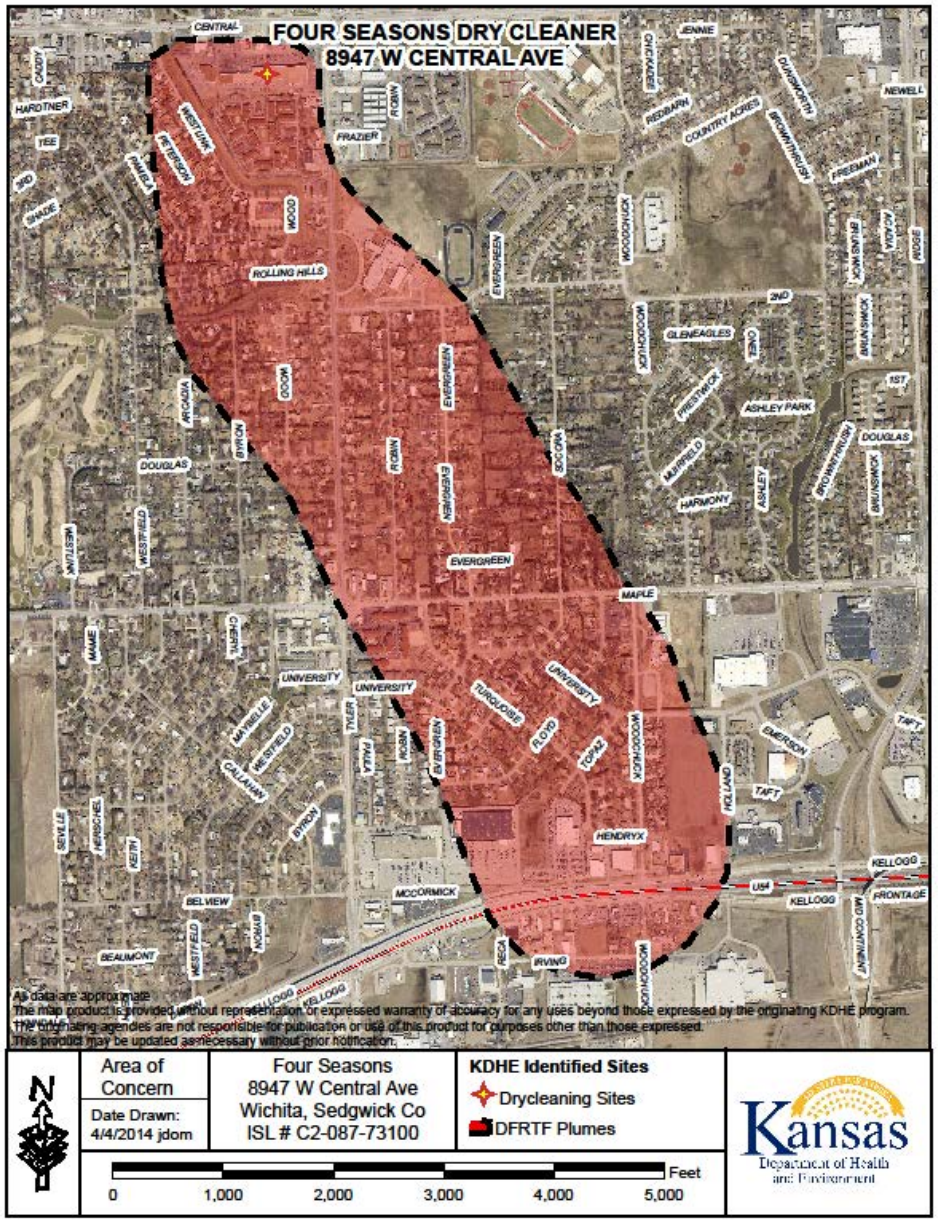
Agenda

- What is the problem?
- Timeline of events to date
- What is the risk?
  - Action Levels
  - Health Concerns
- Emergency action – Interim alternative water supply
- Long term alternative water supply
- Long term corrective action

What is the Problem?

- Groundwater contamination from a former dry cleaner
- Impacted domestic water wells
- Unknown when the release(s) occurred

Regional Map



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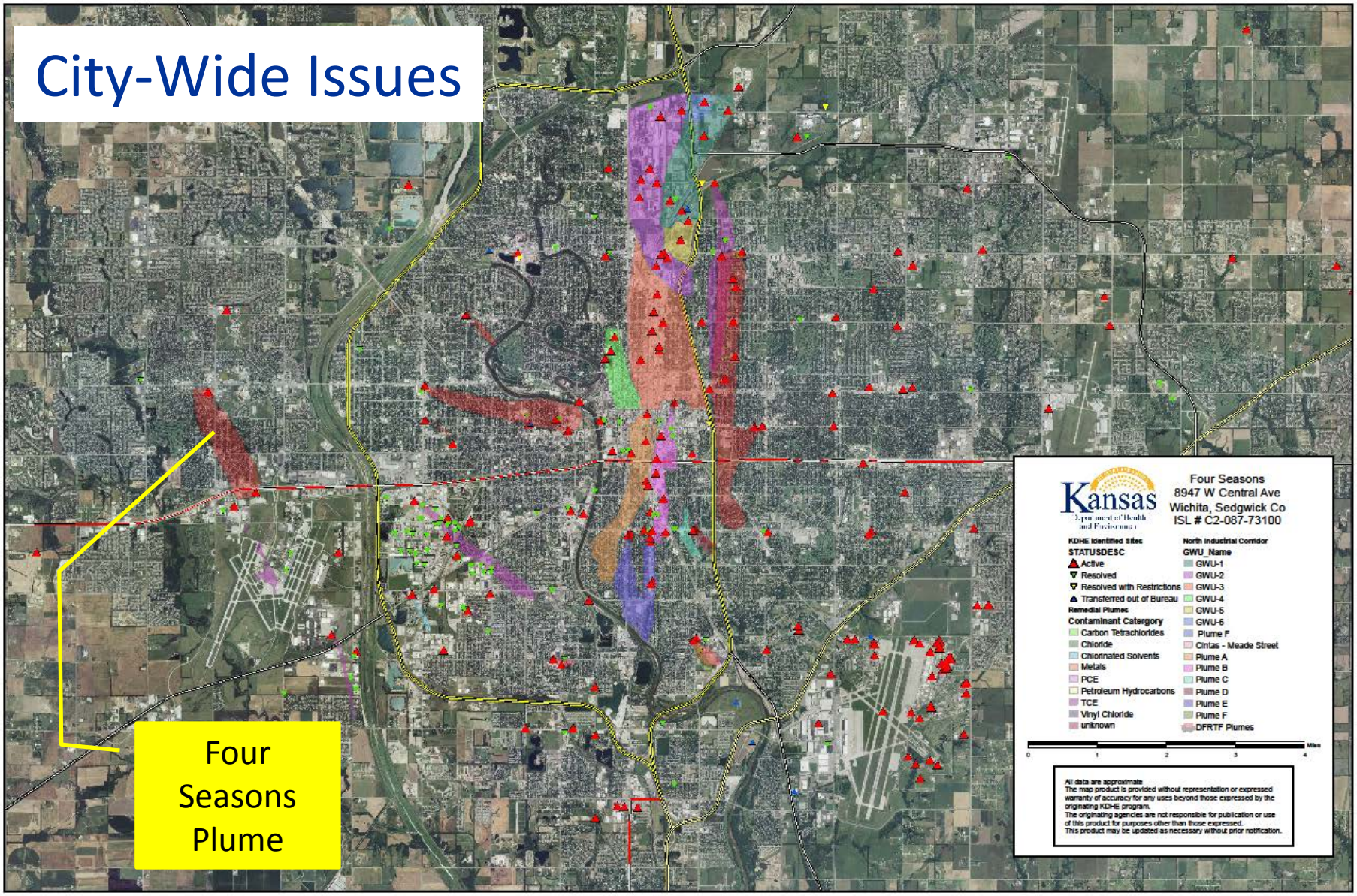
Why is there a problem

- Dry Cleaning Industry – Common sources of releases that were considered appropriate practice
  - Separator water into sewer lines
  - Filters were disposed in dumpster – liquid drains out
  - Routine spills and leaks No containment pans

City-Wide Issues



8947 W. Central Facility History

- Early 1960 – Cowboy Cleaners: Reportedly had coin operated dry cleaning machine(s)
- 1960s – Converted to a dry cleaning facility – no coin op
- 1980 - Name change to Four Seasons Dry Cleaners
- 2001 – Changed ownership within family
- 2004 – Phase II Environmental Site Assessment – 2 soil borings
- 2005 – Last year registered as a dry cleaning facility
- 2006–2008 – Registered as a drop off location
- 2008 – Closed following a fire

PCE Investigation History

(*slide was revised 4/24/14*)

- December 2009 – PCE identified in direct push probes at the Standard Products/West Kellogg Site at 7920 W. Kellogg.
  - PCE – maximum 8.1 ppb Placed on list of contamination to be investigated.
- Early 2014 KDHE Site Assessment Program - Investigation to ID source of West Kellogg contamination.
  - Identify domestic wells upgradient of Standard Products.
  - Extensive well survey between W. 2nd St. N. and Maple and N. Tyler Rd and Socora St.

PCE Investigation History

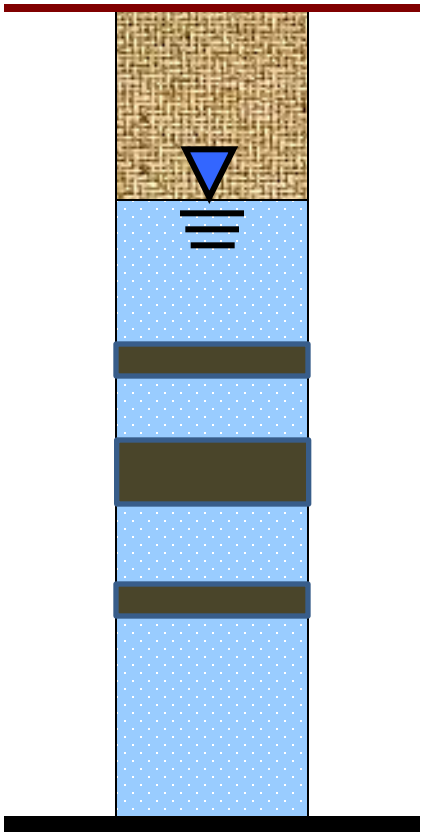
- March 24, 2014 - Groundwater assessment confirms a source of groundwater contamination as Four Seasons Dry Cleaners
  - Transferred to KDHE Dry Cleaner Remediation Program
- March 24th to present – Sampling private wells
- March 31st – KDHE supplemental field investigation to delineate the contamination with mobile laboratory.
  - Direct Push – Groundwater sampling
    - 3 depths between 30 – 55’ bgs

PCE Investigation History

- April 3rd – First good understanding of the boundaries of the PCE groundwater plume.
  - KDHE begins to develop a Phase I approach for property within the primary area of concern (AOC).
  - Phase II – Taking names for properties outside the AOC. Future sampling pending for confirmation sampling. Not all homes will be sampled.
  - Bottled water delivered to first round of properties w/PCE contamination.
- April 5th – 1st carbon filtration systems installed for systems above removal management levels (RML).

General Geologic Conditions

- Clay to silty clay - surface to 15 ft bgs
- Fine to medium sand interbedded with clay lenses (2-5’ thick)
  - Unknown depth: to 120+ feet
  - Varies based on location within the plume



What is PCE?

- PCE was the primary solvent used at the dry cleaner
- Clear, colorless liquid that has a sharp, sweet odor and evaporates quickly.
- PCE degrades to
  - Trichloroethylene (TCE),
  - Cis 1,2-dichloroethylene (DCE) and
  - Vinyl chloride (VC).
- Routine dry cleaning operations – Industry Standard
  - Separator water disposal through the sewer system,
  - Disposal of spent filters in dumpsters and
  - Leaks/Spills

How is the risk calculated?

PCE risk is calculated based on a chronic exposure. Risk based calculations are commonly based on a 20 to 30 year exposure.

- Chronic health effects - Prolonged or repeated exposures over many days, months or years. Symptoms may not be immediately apparent.
- Acute health effects - Sudden and severe exposure and rapid absorption of the substance. Normally, a single large exposure is involved. Acute health effects are often reversible. Examples: carbon monoxide or cyanide poisoning

Maximum Contaminant Level

- Drinking Water
  - PCE = 5 ppb
  - TCE = 5 ppb
  - Cis 1,2-DCE = 70 ppb
  - Vinyl Chloride = 2 ppb
- Determined by EPA, adopted by KDHE
- Based on probability of an additional cancer incidence.

Removal Management Level

- Groundwater Concentration – ppb

Exposure	Child PCE	Child TCE	Child VC	Adult PCE	Adult TCE	Adult VC
Non-Carcinogen	104	7.7	108	156	9.9	205
Ingestion	282	23.5	141	657	54.8	329
Inhalation	250	12.5	626	250	12.5	626
Dermal	489	147	1,750	1,100	329	4,150
Carcinogen	974	21.8	1.5	974	21.8	1.5

- Based on probability of an additional cancer incidence.
- Used to determine when showering, washing is allowed.

What is 1 ppb?

- 1 Part per billion ppb = 1 microgram per Liter
- 1/1,000th teaspoon of dye in a 21-foot diameter by 4-foot deep swimming pool;
- 1 sheet in a roll of toilet paper stretching from New York to London;
- 1 marble among 20 football fields covered with marbles; or
- 1 inch in 15,782 miles.

Non Carcinogenic Health Risk - PCE

- Exposure to PCE can cause adverse non-cancer effects on the human nervous system.
- Long-term exposure to PCE can also pose a potential human health hazard to reproduction and development, and to the kidney, liver, immune and hematologic systems.
- People exposed to high levels of PCE (>100,000 ppb vapor), even for brief periods, may experience symptoms such as dizziness, fatigue, headaches, confusion, nausea, and skin, lung, eye and mucous membrane irritation.

Carcinogenic Health Risk - PCE

- EPA has determined that PCE is a “likely human carcinogen.”
- In laboratory studies, PCE has been shown to cause cancer in rats and mice when they ingest or inhale it.
- There is also suggestive evidence, from several studies of workers in the laundry and dry cleaning industry, that PCE exposure is associated with elevated risks of certain types of cancer (including bladder, non-Hodgkin lymphoma, and multiple myeloma—blood cancer).

Alternative Drinking Water

1. Immediate hookup to existing city water mains. Any home above MCL or within designated buffer zone.
2. Bottled water for homes above MCL, but below RML.
3. Point of Entry (whole house) Carbon Filtration. Any home above the RML.
4. Install city water mains and connect all homes in the final area of concern.
    1. City Ordinance

City Water Main

1. Requires design, bidding and installation
   - Robin Rd,
   - Evergreen Ln.,
   - Part of W. Rolling Hills Dr.,
   - Part of Socora St.
2. If capital cost paid by KDHE, no specials for water mains
3. City Ordinance – Questions?
   1. Contact Wichita/Sedgwick County Environmental Health Dept. at 316-268-8351

Use of Lawn & Garden Wells

Ways of using the water	How you can protect your health
Watering lawns, washing cars, gardening or playing in the sprinkler	• Cold water releases fewer VOCs, and using the water outdoors allows remaining VOCs to escape into the air where they are diluted and cannot be breathed in as easily. • Avoid drinking or accidentally swallowing the water. • Use a sprinkler when water the lawn or garden. This will promote volatilization of the VOCs. • Studies indicate that plant uptake of PCE are negligible and do not pose a serious risk to human health. Residents should thoroughly wash plants and vegetables from the garden.
Filling private pools, spas and wading pools	• Wait 24 hours after filling the pool before using it to allow some of the VOCs to volatilize. • Make sure the pool is kept outside and not covered. • Avoid drinking or swallowing the water. Supervise children and pets.

Use of Lawn & Garden Wells

Ways of using the water	How you can protect your health
Using the water in indoor shops or garages, greenhouses or other enclosed areas	· VOCs will "off-gas" into the indoor air, which means that you can breathe in the chemicals. · Make sure the area is well ventilated by keeping doors and windows open, and using exhaust fans, if possible. · Keep the time spent in the area where the water is used to a minimum.
Watering animals, pets and birds	· Animals can be affected by VOCs in a similar manner as humans. · A hose and spray nozzle can be used to fill a bucket or other container. The spray will help promote volatilization. A full bucket of water can be left overnight to allow additional time for the VOCs to volatilize.

Water Well Sampling

- KDHE's Dry Cleaning Program will sample homes determined to possibly be impacted by the Four Seasons Dry Cleaning contamination.
- Sampling your own well:
  - EPA Method 8260
  - Analyzed by an accredited laboratory for VOCs
    - Accredited laboratories in Kansas
    - http://www.kdheks.gov/labs/index.html
    - Some environmental consultants can assist with collecting and analyzing water samples.
- Wichita/Sedgwick County Environmental Health Department – 316-268-8351

Corrective Action

- KDHE Dry Cleaning Program – Project Lead
- Source Investigation – Investigate soil contamination
- Expanded Site Assessment – Investigate Groundwater impacts
  - Vertically and spatially
- Remedial Design and Implementation
  - Soil
  - Groundwater

Questions

www.kdheks.gov

Kansas
Department of Health and Environment

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